

WHAT IS CLAIMED IS:

1. A process for the decomposition of fluorine compounds over a catalyst comprising a step of contacting said fluorine compounds, in the presence of water vapor, oxygen and an inert gas as a diluent gas, with a fluorine compounds decomposition catalyst and a catalyst the decomposition oft least one of CO, SO₂F₂ and N₂O to decompose said fluorine compounds.

2. A process for the decomposition of fluorine compounds as claimed in claim 1, wherein a gas containing said fluorine compounds is made in contact with said a fluorine compound decomposition catalyst, and then is made in contact with said a catalyst the decomposition oft least one of CO, SO₂F₂ and N₂O.

3. A process for the decomposition of fluorine compounds over a catalyst comprising steps of decomposing said fluorine compounds by contacting a fluorine compounds decomposition catalyst in the presence of water vapor and an inert gas as a diluent gas; adding oxygen or an oxygen-containing gas to a gas formed by said decomposition; and making said gas in contact with said a catalyst the decomposition oft least one of CO, SO₂F₂ and N₂O.

4. A process for the decomposition of fluorine compounds comprising a step of the decomposition and removing SO₂F₂ from a gas containing SO₂F₂, said step comprising a step of contacting said gas containing SO₂F₂ over a catalyst for decomposition of SO₂F₂ in the presence of water vapor and oxygen.

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5. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein said a catalyst for the decomposition of at least one of CO , SO_2F_2 or N_2O contains at least one selected from Pd, Pt, Cu, Mn, Fe, Co, Rh, Ir and Au in the form of a metal or an oxide.

6. A process for the decomposition of fluorine compounds as claimed in claim 5, wherein said catalyst for the decomposition of at least one of CO , SO_2F_2 or N_2O further contains at least one oxide selected from La and Ba.

7. A process for the decomposition of fluorine compounds as claimed in claim 1 or 3, wherein said a catalyst for the decomposition of at least one of CO , SO_2F_2 or N_2O is selected from a catalyst of Pd and La carried on alumina, a catalyst of Pt and La carried on alumina, a catalyst of Rh and La carried on alumina, a catalyst of Au and La carried on alumina, a catalyst of Ir and La carried on alumina, a catalyst of Pd carried on alumina, a catalyst of Pt carried on alumina, a catalyst of Cu carried on alumina, a catalyst of Mn carried on alumina, a catalyst of Pd and W carried on titania and a catalyst of Co carried on alumina.

8. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein said gas having been decomposed by contacting with said catalyst for the decomposition of at least one of CO , SO_2F_2 or N_2O is put through water or an alkaline aqueous solution to remove hydrogen

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fluoride and a water-soluble component contained in said gas.

9. A process for the decomposition of fluorine compounds as claimed in claim 1 or 3, wherein said fluorine compounds decomposition catalyst contains aluminum and nickel in the form of an oxide, and a ratio thereof in atomic ratio is from 50 to 99 mol% for aluminium and from 50 to 1 mol% for nickel.

10. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein a reaction temperature for said a catalyst for the decomposition oft least one of CO, SO₂F₂ or N₂O is from 650 to 850°C.

11. A process for the decomposition of fluorine compounds as claimed in claim 1, wherein said a fluorine compound is one selected from PFC, HFC, SF₆ and NF₃.

12. An apparatus for the decomposition of fluorine compounds comprising a reactor having a catalyst for decomposing said fluorine compounds and a catalyst for the decomposition oft least one of CO, SO₂F₂ or N₂O charged therein; a heater for heating said catalysts in said a reactor; a moisture supplying unit for adding moisture to said fluorine compounds supplied to said reactor; an oxygen supplying unit for adding oxygen or an oxygen-containing gas; and an inert gas supplying unit for adding an inert gas as a diluent gas.

13. An apparatus for the decomposition of fluorine compounds as claimed in claim 12, wherein said reactor having said catalyst for decomposing said fluorine compounds charged

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upstream therein and said catalyst for the decomposition of at least one of CO , SO_2F_2 , or N_2O charged downstream therein.

14. An apparatus for the decomposing a fluorine compounds comprising a reactor having a catalyst for decomposing said fluorine compounds charged upstream therein and a catalyst for the decomposition of at least one of CO , SO_2F_2 , or N_2O formed by said decomposition charged downstream therein; a heater for heating said catalysts in said reactor; a moisture supplying unit for adding moisture to said fluorine compounds supplied to said reactor; an inert gas supplying unit for adding an inert gas as a diluent gas; and an oxygen supplying unit for adding oxygen or an oxygen-containing gas to a gas containing at least one of HF , CO , SO_2F_2 , and N_2O formed by decomposition of said fluorine compounds.

15. An apparatus for the decomposing a fluorine compounds comprising an apparatus for the decomposition of and removing SO_2F_2 from a gas containing SO_2F_2 comprising a reactor having an SO_2F_2 decomposition catalyst charged therein; and means for adding water and oxygen to said gas supplied to said reactor.

16. An apparatus for the decomposing a fluorine compounds as claimed in claim 12 or 14, wherein said catalyst for the decomposition of at least one of CO , SO_2F_2 , or N_2O contains at least one selected from Pd , Pt , Cu , Mn , Fe , Co , Rh , Ir and Au in the form of a metal or an oxide.

17. An apparatus for the decomposing a fluorine compounds

as claimed in claim 12 or 14, wherein said catalyst for the decomposition of at least one of CO, SO₂F₂ or N₂O is selected from a catalyst of Pd and La carried on alumina, a catalyst of Pt and La carried on alumina, a catalyst of Rh and La carried on alumina, a catalyst of Au and La carried on alumina, a catalyst of Ir and La carried on alumina, a catalyst of Pd carried on alumina, a catalyst of Pt carried on alumina, a catalyst of Cu carried on alumina, a catalyst of Mn carried on alumina, a catalyst of Pd and W carried on titania and a catalyst of Co carried on alumina.

18. An apparatus for the decomposing a fluorine compounds as claimed in one of claims 12, 14 and 15, wherein said apparatus further comprises a gas scrubbing tower removing hydrogen fluoride and other water soluble components from a gas discharged from said reactor by contacting said gas with water or an alkaline aqueous solution.

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